Eva Srejber: The transmission mechanism

Speech by Ms Eva Srejber, Second Deputy Governor of the Sveriges Riksbank, at Umeå University, Umeå, 15 May 2001.

* * *

The Riksbank has a statutory duty to maintain price stability. However, it has the power to decide how to operationalise monetary policy and the monetary policy strategy that is to guide the monetary policy decisions. In the annual assessments of the performance of the Riksbank made by the Riksdag Finance Committee, both the objective and the strategy adopted have won acceptance. Monetary policy is governed by an inflation target expressed as the annual rate measured by CPI is to be limited to 2 per cent with a tolerance interval of ± 1 percentage point.

However, the decision to define price stability as a reduction in the value of the krona by two per cent per year in relation to the basket of goods and services consumed by Swedish households is by no means self-evident. In principle, another rate of price increases, other weighted combinations of goods and services, financial assets or currencies could serve as the anchor in relation to which the value of the krona is to be kept stable. When the inflation target was adopted in 1993, conditions did not favour a return to any form of fixed exchange rate. The decision that had to be made then was how best to design monetary policy to cope with the transition from a high to a low-inflation economy while, at the same time, creating suitable conditions for returning to a fixed exchange rate regime. CPI was deemed to be the best known measure of inflation and this was one reason why it was very suitable in a situation where confidence in stable prices was to be attained. An inflation rate of two per cent was considered to be well in line with inflation in the rest of the EU and this was adopted to create a basis for stabilising the nominal exchange rate of the krona in relation to the European currencies.

By monetary policy strategy I mean the entire framework used to comply with the ultimate objective that monetary policy is intended to achieve. Besides operationalising the target, this concerns, for instance, how the system is to be designed to enable the central bank to influence interest rates and how open and clear monetary policy is to be. It is also about taking decisions on any intermediate objectives and the time horizon in which fulfilment of the objective is to take place.

The decision on monetary policy strategy fundamentally rests on conceptions of how the mechanisms operate that permit the central bank to determine the value of money – what is known as the transmission mechanism. For the most part, however, there is little knowledge of these very complicated mechanisms. The rapid development in the financial markets means moreover that the conditions for monetary policy are continually changing. It is therefore natural for the rules of action and strategies that govern monetary policy to be discussed and evaluated. I am going to begin by giving a short review of how the transmission mechanism is usually described and to discuss the changes that have taken place. Against this background, I will then briefly describe how the Riksbank conducts its monetary policy.

What is the role of money?

The quantity theory describes in a simple way how inflation is determined. In this theory, the price level is determined by the quantity of money in the economy. Production is determined over a somewhat longer period by access to labour and by the development of productivity; monetary policy does not affect production in the long term. It is intuitively easy to understand that at a given level of production the price level will increase if the quantity of money increases and vice versa if the quantity of money decreases. In an economy where only banknotes and coins serve as means of payment, the central bank can control inflation by determining the quantity of banknotes. This is conditional on the central bank knowing how much is required at a given price level in order for a particular quantity of goods to be produced and circulated - the speed or velocity of circulation must be known in order for a money quantity target to be used to control price movements.

Developments in the financial markets in general and of the payment system in particular have, however, led to a reduction in the importance of banknotes and coins as a means of payment, i.e. money. An increasing proportion of payment flows takes place by transfers between accounts and the ability of the central bank to influence the quantity of money in the economy is largely only through its ability to affect the demand for money by the general public. The quantity of money required by the

general public depends on its demand for transaction funds for the purchase of goods, services and financial assets, which in turn is affected by the interest rates encountered by the general public. For instance, lower interest rates increase demand for money when businesses' demand for capital goods and households' demand for consumption increases. Thus, demand for goods and services are both sensitive to interest rates and largely reflect one another.

By controlling the interest rate, the central bank thus affects both the demand for goods, services and financial assets and the demand for money. Banknotes, coins and bank deposits can immediately be transformed into means of payment and are therefore often used to define the quantity of money. The banks can increase the quantity of money by, for instance, increasing lending or by purchasing securities from the general public since a large part is returned as liquid deposits.

However, the quantity of money in the form of deposits and banknotes and coins that the general public decides to keep as a liquidity buffer in readiness for coming transactions is also affected by the stability of the value of other assets and how rapidly they can be transformed into means of payment. Having funds in a current account at a bank or keeping banknotes in a mattress does not produce a return. It is therefore better, of course, to, for instance, purchase interest-bearing treasury bills which can be rapidly converted into transaction funds when wishing to make a payment.

The ability to borrow money quickly also affects the willingness to keep a liquidity buffer in the form of banknotes, coins and liquid bank deposits. Efficient second-hand markets and access to overdraft facilities have, for instance, affected the needs of the public to keep a liquidity buffer. The public's need for transaction funds for purchase of shares has probably also increased and it is likely that it varies with developments in the stock market. Many factors have thus contributed to changes in the rate of circulation of money[1] and it has therefore become more difficult to predict.

To sum up, the role of money for the level of prices in the economy has not fundamentally changed. What has happened is that the trend in the financial markets has meant that it has become more difficult for the central banks to use the quantity of money as an intermediate target for an ultimate price stability objective. Most central banks therefore now use the quantity of money as one indicator of inflation among others. However, there are considerable differences between the assessments made by different central banks of the importance of the quantity of money as an indicator of price trends. The European Central Bank – the ECB – notifies, for instance, a reference value for the increase in the quantity of money that is considered to be compatible with their price stability objectives.

The influence of monetary policy on the output gap

The difficulty of using the quantity of money as an intermediate target for an ultimate price stability objective has contributed to an increasing number of central banks moving over to direct control through an inflation target. Put simply, they use the mechanisms that enable the inflation target to be described as follows: A change in the instrumental rate affects GDP which in turn has an effect on inflation. If GDP increases at a rate that makes full use of production resources, inflation is not changed although if demand is so high that production resources are under pressure, then inflation will increase. When resources are under pressure, it is said that there is a positive output gap and vice versa when there are free resources in the economy. When growth is balanced, it is said that GDP increases in accordance with its potential growth path. According to this simple model, the central bank is able to affect inflation through its ability to affect the output gap.

The emphasis here is not on the effect of the interest rate changes on demand for money, for instance, to be able to make payments for investments and consumption, but directly on the effect that the interest rate has on the real demand.

The channels that enable the steering interest rate to have an effect on the output gap can be categorised in different ways:

The most important channel is probably the interest rate channel. A change in the steering interest rate directly affects the shortest market rate. The banks can normally finance a deficit and invest a surplus at that rate. The shortest market rate and market expectations on future changes in the instrumental rate therefore constitute the alternative cost of the banks' financing or the alternative

---

[1] The quantity theory: $m^* = y + p - v$ shows a demand function for money in the logarithmic form of $M/P = 1\,(Y, i)$ where M is the volume of money, Y is the real GDP, i is the interest rate and $V = Y(M/P)$ is the rate of circulation, i.e. the velocity.

return on the bank's loans and holdings of securities. The banks' lending rate and the interest rate on securities are therefore affected by the actual and expected instrumental rate. Monetary policy thus also has a direct effect on the interest rates encountered by the general public.

i.   Investment and consumption decisions are affected directly by the interest channel. The required return on investment is reduced at a lower interest rate at the same time as saving is less profitable.

ii.   Interest rate changes also have an income effect through interest income and interest expenditure on existing assets and liabilities.

iii.   Interest rate changes also affect share prices and real estate prices – lower interest rates increase demand for shares and properties and prices increase. An interest rate reduction also affects household wealth through higher share and property prices which in turn affect consumption decisions.

The interest rate channel therefore affects demand for goods and services and thus the output gap with some time lag through many complicated mechanisms. Changes in the use of resources or the output gap then affect inflation in turn, with some time lag.

The impact of changes in the instrumental rate on demand and inflation may also be affected by the lending rate set by the banks. The channel that is mediated by the behaviour of the banks can be generally referred to as the credit channel. Higher interest rates may, for instance, reduce the willingness of the general public to keep funds deposited in current accounts, which have a very low return. Deposits have a very low financing cost for the banks and if they have to finance an increased proportion of their lending in another way, the banks may compensate for this by a higher lending rate. However, it is uncertain how the behaviour of the banks affects the impact of monetary policy.[2]

Changes in the instrumental rate have an effect through the "exchange rate channel" partly by changes in the nominal exchange rate for the krona affecting the relative prices for net export. Higher interest rates should thereby strengthen the domestic currency and make domestic goods more expensive relative to other goods and vice versa. Higher interest rates thereby dampen export at the same time as import becomes cheaper and increases. Lower demand for domestic goods contributes to reducing the use of resources and subduing inflation. A stronger nominal exchange rate dampens consumer prices at the same time since part of consumption is directed towards imports when prices are dampened. However, lower import prices also increase the real purchasing power which per se contributes to increasing purchasing power. In economies with diversified industry an increase in the interest rate thus also leads via the exchange rate channel to lower inflation. The strength of the effect depends inter alia on income and price elasticities and on the composition and size of foreign trade. In certain cases the positive effect on incomes from stronger currency can even predominate and vice versa.

Changes in the nominal exchange rate probably have less impact on import and export prices if the changes are not considered to be lasting. In a floating exchange rate regime, it is therefore probable that changes in the nominal exchange rate will not have such a great effect as in the case of a devaluation or revaluation in a fixed exchange rate regime.

The role of inflation expectations

The channels I have now pointed out operate in most cases through demand and the output gap. One channel that is probably very important and which does not operate through resource use in the economy is the effect of monetary policy on inflation expectations and its impact on price-setting conduct and how price changes are received in the economy. There is scarcely any doubt that inflation expectations played an independent role prior to the inflation target achieving credibility in the mid-1990s. Now that the inflation target appears to be well known and generally accepted and inflation expectations are well in line with the inflation target, the role of expectations in the transmission mechanism is not so self-evident. However, stable and low inflation expectations should affect businesses' pricing and wage formation. If the players in the economy are confident that inflation really will be held at a low level, this could also lead to companies not considering that they have to change

---

[2]   See Kerstin Hallsten, "Bank loans and the transmission mechanism of monetary policy", Sveriges Riksbank Working Paper Series no. 73-1998.

their prices so often, for instance, in the event of changes in costs that are perceived as temporary. If the expectations are not met, there is a risk that price changes will be large when they finally occur.

Stable inflation expectations can thus lead to inflation not varying continuously with the output gap which paradoxically can make the conduct of monetary policy more difficult. In recent years, it has been difficult to find clear and reasonable correlations between the demand situation and inflation for Swedish data. The monetary policy decisions are based on forward-looking assessments of inflation and here the assessment of the relationship between the expected output gap and inflation is an important determining factor. A lower correlation could depend on inflation expectations having stabilised in recent years. Individual companies can, for instance, hold back price increases even if resource use has increased, if they believe that their competitors are not intending to raise their prices. As long as inflation expectations are not affected, prices will not be changed. If the forward-looking inflation assessments that serve as the basis for monetary policy decisions, assume, for instance, that the correlation between growth and inflation will continue to be as low as has been observed, this can result in changes in the output gap not leading to any immediate monetary policy response. The risk is that inflation expectations will then accelerate and that inflation will increase. In the same way, prices may be slow to respond in the case of falling resource use. In other words - if monetary policy does not act as expected on fluctuations in resource use, the correlation between growth and inflation can again increase. Presumably the relation between the output gap and inflation varies both with the level of the output gap, with the speed of the change in the output gap and with the expectations on central bank behaviour.

The Riksbank's monetary policy strategy

An important part of the Riksbank's monetary policy inflation target strategy is clarity and openness about the bases on which monetary policy decisions are made. The intention is to create support for the price stability target and understanding of what governs interest rate decisions. This clarity means that the Riksbank's interest rate decisions are often expected and this increases the ability of the Riksbank to affect the somewhat longer rates through its analysis. This openness should also contribute to stabilising inflation expectations.

The monetary policy decisions are based on forward-looking inflation assessments of CPI and UND1X – a price index adjusted for certain temporary effects. These assessments are reported in the Riksbank's inflation reports which are published four times a year. The minutes of the monetary policy meetings which are held between six and eight times a year are published with a couple of weeks time-lag.

Inflation assessments are made with a two-year time horizon while paying some attention to the potential developments in the third year. Important determining factors for inflation are the development of demand and the output gap. A number of inflation indicators are used, however, to make the assessments. The quantity of money has no special role in the analysis although it is used as one of many indicators.

The reason for decisions resting on forward-looking assessments of inflation is that monetary policy has an effect with some time lag. The major part of the effect of an interest rate change is expected to occur after one to two years although monetary policy is assumed to have some effect before and after this time horizon.

The channels that allow monetary policy to have an effect on inflation are assumed to a large extent to operate through the output gap which means that a change in interest rates will first affect resource use which will then only have a tangible effect on inflation later. Normally, inflation assessment puts most weight on the next one to two years in the conduct of monetary policy. However, the perspective that monetary policy aims at also depends on the expected economic situation. If inflation diverges considerably from the objective in the coming period, this may weigh more heavily than a small deviation later on. Likewise, an anticipated higher or lower inflation after the one-to-two year perspective can be weighed in.

Since the impact of a change in interest rates on inflation in the first year can be assumed to be small, large changes in interest rates are required to have an effect on inflation already in the first year. Attempts to affect inflation already within a year would in the view of the Riksbank lead to major fluctuations in employment and production.

The correlation between interest rate changes, GDP and inflation is, however, not so unambiguous and clear. There may be considerable uncertainty on the time lag and the strength of the effect of monetary policy on inflation. It is probably the case that the strength of the effects and the time lag will vary. As I previously discussed, it is also uncertain what role inflation expectations play in the transmission mechanism.

Should monetary policy take asset prices into consideration?

A discussion that has become pertinent due to the great increase in the price of IT and technology shares in particular that preceded the economic downturn in the United States as well as in Sweden – is the extent to which it is reasonable and possible to counteract the building-up of financial imbalances by monetary policy. If monetary policy is exclusively focused on an inflation target, asset prices are taken into account to the extent that they affect inflation by wealth effects and stimulation of investments and consumption. Appreciation of the currency, temporary productivity gains and loan financing of financial assets can, however, lead to the accumulation of major financial imbalances without this being fully visible as inflationary pressure. This was the case in Japan in the 1980s, Thailand in the 1990s and in the United States today. Unmotivated increases in asset prices will sooner or later lead to corrections, however. The strong boom in growth will then be replaced by a deep and prolonged downturn. If the level of debt is high in the initial position and confidence in the economy is weak, it may be difficult for monetary policy to affect demand and inflation in this situation, which has been the case in Japan in recent years.

Some analysts consider that both prices and production would develop in a more stable way over time if monetary policy counteracted exaggerated price increases in shares and other financial assets. It is said that it is not much more difficult to determine when share prices indicate unrealistic future increases in profit than it is to determine how quickly production in an economy can grow in the long term. And such assessments are of key importance to all monetary policy decision-makers. Others think that besides it being difficult to determine when asset prices are exaggerated, it is doubtful how large an effect an increase in interest prices would have. This is particularly the case with regard to share prices in small countries since the stock markets are so internationalised.

Clarity and flexibility

What I have discussed here shows that monetary policy decisions cannot be made on the basis of mechanical rules of action. The transmission mechanism is complicated and probably not stable over time either. Regardless of the monetary policy strategy adopted, monetary policy decisions must rest on uncertain assessments. This may relate to assessments of the output gap and the correlation between growth and production, the rate of circulation of the quantity of money and the effects of large increases in asset prices.

Monetary policy must then be conducted in a flexible way based on the available information. This means, for instance that assessments of whether financial imbalances are being built up and the risks that are associated with this must be taken into consideration in some way when monetary policy decisions are made. And even if the possibility for an individual central bank to influence a strong international stock exchange increase through interest rate hikes is very limited, nothing will be improved by an excessively expansive monetary policy. The increase in share prices is moreover often followed up by a price increase in the real estate market and in contrast to the stock exchange, this is local and thereby to a greater extent dependent on the national interest rates. A more in-depth analysis of the quantity of money and expansion of credit can give leads as to what happened with household and corporate balance sheets and in the financial institutions, In certain periods, it can therefore be justified to give the analysis of lending and monetary policy increased weight.

The complexity of the transmission mechanism combined with the necessity of clarity and openness sets considerable challenges for monetary policy decision-makers. It is important to avoid simplifying to such an extent, in the endeavour to create understanding of what one is doing, that one compromises one's freedom of action.